

[Time: 3 Hours]

[Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Question No.1 is **Compulsory**.

2. Attempt any 3 questions out of rest.

3. Make suitable assumptions if any.

4. All questions carry equal marks.

- Q.1**
- a) Differentiate between file system and database system with an example **05**
 - b) Explain Referential Integrity with suitable example **05**
 - c) List the steps required to map ER , EER model to relational model **05**
 - d) Explain the ACID properties of transactions **05**
- Q.2**
- a) Explain the following Relational Algebra operations with suitable example. **10**
 - a) Project b) Select
 - c) Union d) Cartesian Product
 - b) Construct an EER diagram and convert into Relational Model for a library Management System. **10**
Specify 2 complex SQL queries on the above-one using Group by clause and the other using Join operation with an example
- Q.3**
- a) Explain the following terms with an example:- **10**
 - i) Natural join. ii) Set Intersection. iii) Weak Entity. iv) Foreign key
 - b) Explain the Overall Architecture of DBMS in detail. . **10**
- Q.4**
- a) Define Deadlock. Explain how deadlock can be handled **10**
 - b) Explain Specialization and Generalization with suitable example **10**

- Q.5** a) For the schema mentioned below **10**
- Employee(eid, ename, address, city) Works(eid, cid, salary)
- Company(cid, cname, city)
- Create an ER diagram for the same and Specify the SQL queries for each of the statements given below
- 1) Modify database so that John now lives in Mumbai, assuming the database entry has John staying in Delhi.
 - 2) Find Employees who live in same city as the company for which they work.
 - 3) Give all employees of "AZ Corporation" whose salary has increased by 15% in the year 2018-19.
- b) Define the term Normalization as used in database design. Explain the various normal forms with an example **10**
- Q.6** Write short notes on **any two** **20**
- a) Log based recovery mechanism
 - b) Triggers and transaction control commands
 - c) Conflict and View Serializability
 - d) Data Independence